REMARKS

In view of the above amendments and following remarks, reconsideration and further examination are requested.

By the current Amendment, claim 3 has been canceled, claims 1, 2 and 4 have been amended, and claims 11 and 12 have been added.

Claims 1 and 2 were rejected under 35 U.S.C. § 102(b) as being anticipated by Capote et al.; claims 1 and 2 were rejected under 35 U.S.C. § 102(e) as being anticipated by Haba et al.; claims 1-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilleo et al. in view of Capote et al., Haba et al. and Itou; and claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilleo et al., Capote et al., Haba et al. and Itou, and further in view of Haas et al.

Claim 1 has been amended to further bring out an inventive feature of the invention. In this regard, amended claim 1 requires that the circuit board is made of a **polymeric resin sheet** and that the **connection terminal, through-hole and electrode pad increase in this order in terms of their cross-sectional sizes**. These additional limitations find support in former claim 3, and Figs. 1A - 4B where connection terminal 16 is shown to have a cross-sectional size less than that of through-hole 14, whose cross-sectional size is shown to be less than that of electrode pad 12.

Thus, the present invention realizes use of a low-cost polymeric sheet for the circuit board, and provides a solution for the difficulty in connecting a connection terminal of an electronic component to an electrode pad formed on a polymeric resin sheet by use of solder bumps having a melting point higher than that of the polymeric resin sheet. In this regard, in place of solder bumps, the electrode pad and connection terminal are connected to one another by **conductive adhesive *filled into* the through-hole**, which through-hole is provided in an adhesive sheet positioned between the electronic component and the circuit board and which bonds the electronic component to the circuit board.

The instant invention solves an additional problem as follows. An electrode pad of a circuit board widely moves over an arranged location of a connection terminal of an electronic component if the circuit board is made of polymeric resin sheet. This is so because, such a circuit board has a thermal expansion coefficient that is considerably different from that of the electronic component. As a consequence, when the electrode pad and the connection terminal are substantially equal in size, they cannot be arranged to face one another with high accuracy or possibly not face one another at all in a worst case scenario. In addition, such shifting of the electrode pads results in opposing areas of corresponding connection terminals and electrode pads differing such that electrical connection through uniform connecting resistance cannot be achieved.

To address this problem, the present invention provides for a specific size relationship among an electrode pad on a circuit board made of a polymeric resin sheet, a connection terminal of an electronic component, and a through-hole in an adhesive sheet positioned between the circuit board and the electronic component. Specifically, the cross-sectional size of the connection terminal is less than the cross-sectional size of the through-hole, which in turn is less than the cross-sectional size of the electrode pad.

Claim 1 is believed to adequately recite the features that allow for the aforementioned problems to be overcome, and the relied upon references are not believed to be applicable with regard to the currently pending claims for the following reasons.

Capote et al. discloses a substrate 20 having an electrode pad 12 thereon. Solder 30 is positioned within a through-hole 28 extending through encapsulant 22, and is used to connect a connection terminal 24 on chip 10 to the electrode pad. However, through-hole 28, electrode pad 12 and connection terminal 24 are not related in size as required by claim 1. Specifically, through-hole 28 does not have a smaller cross-sectional size than electrode pad 12. Thus, claim 1 is not anticipated by Capote et al.

Haba et al. discloses an electrode pad 908 embedded in circuit board 906, and an electronic component 900 having a connection terminal 904 thereon. Positioned between the circuit board and the electronic component is a dielectric layer 910 having through-holes 912.

However, through-hole 912, electrode pad 908 and connection terminal 904 are not related in size as required by claim 1. Specifically, through-hole 912 is not shown to have a larger cross-sectional size than connection terminal 904. Additionally, Haba et al. does not disclose or suggest a conductive adhesive "filled" into the through-hole 912, as required by claim 1. Indeed, much of through-hole 912 is vacant and a vapor grown conductor 914 is used to connect the connection terminal 904 to the electrode pad 908. Thus, claim 1 is not anticipated by Haba et al.

With regard to the 35 U.S.C.§ 103 rejection, it is respectfully submitted that one having ordinary skill in the art would not have found it obvious to modify Gilleo et al. to arrive at the invention as recited in claim 1. In this regard, the circuit board 120 of Gilleo et al. has high rigidity and a low heat expansion coefficient since it is a dielectric substrate. This low heat expansion coefficient translates into a small amount of displacement of electrode pad 200 which is on the circuit board, whereby potential mis-alignment of electrode pad 200 relative to connection terminal 150 is not an issue of concern. Accordingly, there is no need for making the cross-sectional size of electrode pad 200 larger than the cross-sectional size of the aperture 180 or larger than connection terminal 150, irrespective of the teachings of Capote et al., Haba et al. and Itou.

Additionally, though the Examiner has provided a motivation to modify Gilleo et al. in view of the teachings of Itou, it is respectfully submitted that the solution proposed by Itou is for a unique situation, which situation is not present in Gilleo et al., whereby one having ordinary skill in the art would not have found it obvious to modify Gilleo et al. as suggested by the Examiner. Specifically, in the prior art discussed in Itou, separation of land 3a of a double-sided circuit board results when a lead-free solder is used to solder a lead L to the land. Please see column 1, line 52 through column 2, line 8. The specific problems addressed by Itou are of no concern in Gilleo et al., and accordingly, there would have been no reason to modify Gilleo et al. as proffered by the Examiner.

Haas et al. does not remedy any of the above deficiencies, and accordingly, claims 1, 2, 4-7, 11 and 12 are allowable over the relied-upon references either taken alone or in combination.

In view of the above amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

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